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ABSTRACT

A description is provided of Los Angeles Valley College's Life Science Learning Center (LSLC), which provides: (1) a resource center addressed to the individualized learning needs of students served by the Biology Department; (2) a learning environment enabling students to proceed in self-paced, activity-centered, concept-oriented experiences in an open-entry/open-exit mode; (3) an environment in which learning requirements can be diagnosed and individual needs provided for in the areas of remediation, reinforcement of regular classwork, and enrichment experiences; and (4) the opportunity for an enhanced degree of interdisciplinary interaction. After outlining the LSLC's objectives, the paper provides information on the operation and organization of the facility, including hours of operation; the LSLC's biotutorial and independent study annex; instructional and staffing considerations such as the physical presence of certificated staff, the use of staff to develop learning activities and programs, the role of student laboratory assistants, and the LSLC's classified staff. Finally, the LSLC's major accomplishments are discussed. A list of CAI programs developed and used at the center is appended. (LAL)

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LIFE SCIENCE LEARNING CENTER
Los Angeles Valley College

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Presented at the National Conference of the League for Innovation in the Community Colleges and the Dallas Community College District
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LIFE SCIENCE LEARNING CENTER
Los Angeles Valley College

The Life Science Learning Center (LSLC) was created under a grant received from the National Science Foundation (CAUSE Program - Comprehensive assistance to undergraduate Science education). LSLC became operational in the Fall of 1978.

A subsequent NSF Grant under its ISEP program was awarded to the College in 1980 for "Increased Computer-Assisted Instruction IN The Biological Sciences".

LSLC is predicated on the following objectives:

1. to provide students served by the Biology Department a facility- a Resource Center, a Life Science Learning Center addressed to their individualized learning needs.
2. to provide a learning environment enabling students to proceed in self-paced, activity centered, concept oriented experiences in an open entry-open exit mode.
3. to provide an environment in which learning requirements can be diagnosed and individual needs provided for in the areas of: remediation, reinforcement of regular classwork and enrichment experiences.
4. to provide the opportunity for an enhanced degree of inter-discip linary interaction, both intra and extra-campus.

Operation and Organization of LSLC

1. LSLC is open:

Day - Monday to Friday - 8am to 3pm

Eve - Tuesday, Wednesday, Thursday - 6pm to 9pm

Operated as an OPEN ENTRY - OPEN EXIT system the student has the option for selecting his or her visitation times to complete assigned activities as well as use of a variety of services and materials to serve individualized needs.

2. Activities are implemented within 2 annexes of the LSLC complex:

I. The BIOTUTORIAL ANNEX

This is the primary activity area for students enrolled in Introductory Biology courses.

II. The INDEPENDENT STUDY ANNEX

Services are provided here for all students enrolled in the Biology Department, namely those enrolled in introductory Biology courses as well as those enrolled in other department disciplines such as anatomy, physiology, microbiology, zoology, botany and oceanography.

Located within this annex are a computer room for generating attendance and evaluation reports, CAI (computer assisted instruction) equipment and a photography work area.

3. Instructional Systems

I. SPIRITUS

This is an interactive learning system comprised of 41 carrels (student work stations). Each carrel is equipped with a tape deck and random access projector. This equipment can be used stand-alone or under the control of a mini-computer which makes possible the tracking of student attendance and performance.

Slide-tape lessons are synchronized through a unique handset device to permit effective interaction of student and subject matter, and to permit self-paced learning opportunities.

Each carrel has appropriate study materials, including live specimen. Observation and activity centered procedures are integrated with the slide-tape presentations.
Certain of the Spiritus stations are designated as quiz carrels. Students upon the completiton of a given module may take a required quiz at a time of their own choice and duration. It is apparent from such an arrangement that learning can truly be individualized. One is not penalized for greater involvement of time nor is one penalized for completition of activities in less time. The greatest merit of this system is undeniably its FLEXIBILITY!

II. CAI - Computer Assisted Instruction

The use of CAI represents the most recent and major addition to our LSLC capability for the improvement of the quality of of instruction.

9 of our 41 Spiritus carrels are equipped for CAI with all the attendant features of the other Spiritus stations preserved.

We have on-line capability with the LACCD Honeywell mainframe from which our programs may be accessed. Six of our CAI stations employ the IBM personal Computer. These microprocessor units additionally give us stand alone capability. They also have a graphics capability. Two years of careful review of the microprocessor market was made in the selection of IBM PC. Considerable effort was required to interface our IBM units with Spiritus, but we now have a viable system which may be of interest to others.

The remaining 3 CAI stations employ the use of Hewlett Packard "dumb" terminals. These actually were the prototype devices used in the development of our CAI program.

It is a wonder to behold student response to CAI. A revolution is at hand in the educational process by virtue of this new learning strategy - a revolution whether we recognize it or not!

A unique feature of our CAI programs is the incorporation of 35mm color slides. The Spiritus random access projector can interface with an IBM PC or a "dumb"terminal to permit simultaneous viewing of CRT text and an accompanying visual. We anticipate to shortly integrate sound with our CAI programs.

The use of CAI has enabled the department to communicate more effectively complex concepts in biology, particularly to students with learning handicaps or deficiencies.

One of the key factors in the success of CAI is the library of programs which has been prepared by the biology department and which is specifically designed to suit the needs and abilities of LAVC students. This tailor-made software, the most widely used, is supplemented by materials from other colleges which are stored in public libraries. (SEE Appendices for listing of CAI programs).

4. LSLC CERTIFICATED STAFFING

There are two important considerations in LSLC staffing.

I. The physical presence of certificated staff:

1.) to provide students with authoritative assistance and direction in the variety of specialized subject matter areas served by the Biology Department - general biology, anatomy, physiology, microbiology, zoology, botany and oceanography;

2.) to supervise the activities of peer tutors;

3.) to supervise and interpret diagnostic and ongoing evaluation techniques - the effectiveness of ongoing programs is reflected by student attendance and achievement as shown in computer printouts;

4.) to provide prescriptive counseling for students requiring remediation and for those who would benefit from enrichment programs.

II. The use of certificated staff to develop learning activities and programs.

1. In this regard instructors on <u>special assignment</u> have in addition to the above responsibilities the added responsibility for participation in curriculum planning and development. This dual responsibility has been effectively discharged to date employing Mrs. Carla Bowman in the fall, 1978 and Mrs Adele Register and Dr. Donna Opoku-Ageyman in spring, 1979.
   Since 1980 the Center has been fortunate in having the services of Mr. George Jaffray, a Professor Emeritus of the Math Department. Mr. Jaffray is an outstanding Computer Programmer.

2. Primary curriculum development has resulted from the use of re-assigned and regular assignments. Software (curriculum material) is crucial to Learning Center operation. A reservoir of varied programs to serve a diversity of needs is basic to the success of any learning center's operation.

   Software development is best effected by those instructors in whose classes the learning materials will be utilized. Most productive in this respect have been the activities of Mrs. Carr (Physiology) and Mrs. Riffenburgh (Microbiology) who have had the benefit of reassigned time, and of Mr. Samuels (General Biology) who is regularly assigned in the Center.

In any staffing assignment serious consideration should be given to the above to secure the most benefit from Learning Center operation.

5 . <u>The use of student Laboratory Assistants.</u>
A significant factor in the operation of LSLC is the use of Laboratory Assistants (student workers). They serve vitally in the preparation and maintenance of all ongoing activities, evaluation proce dures and in the important function of peer tutoring.

Lab Assistants are recruited on the basis of scholarship and the recommendation of Biology Department Professors. Not only is their presence crucial to LSLC operation, but it is an invaluable experience for them as well. The training and background received is important in their own self assessment and definition of future undertakings.

6. LSLC Classified Staffing

The focus of the management of all LSLC operation is the position titled, Life Science Laboratory Technician.

Responsible to the Director of the Center the duties of this position transcend those normally associated with the job title and accompanying job specifications.

The security and basic continuity of the Center's operation from minute to minute and hour to hour through the day depend upon the knowledge, initiative, resourcefulness and dedication of the Laboratory Technician (to whom we refer as the Lab Manager).Other staff members have varying responsibilities in other locations and at varying times.

This staff person requires a substantial biological science background& a sensitivity and expertise in dealing with a host of people including LSLC staff, administrative and maintenance staff and particularly the large student population which traffics through the Center.Familiarity with sophisticated electronic devices, maintenance and ordering proceedures is also paramount to the success of the "Lab Manager".

The position more aptly might be designated as that of a Learning Center Specialist which should be intermediate to the regular Classified person and a Certificated staff person. In actuality it could best be filled by a non-teaching, Certificated position.

7. Some Concluding Thoughts

I. More and more students are facing the two-fold problem of inability to cope with the rigorous demands of current classwork and inadequate background for required Biology classes and/or programs. We currently face the possibility that subject matter deficiencies will outstrip our efforts to confront them.

The implementation of new remedial and prerequisite courses in science, especially for the vocational student, is increasing the demand for instructional support services which are essential for bringing individuals up to the subject matter standards associated with college level science courses.

LSLC has increased student opportunities for self-paced learning; it has provided increased support services that parallel lecture and lab content; it has enabled the department to better assist the educationally disadvantaged students seeking entry into health allied fields and it has made significant strides in the emergent area of CAI which can serve the best interests of the entire student population spectrum.

II. LSLC Accomplishments include:

1) completion of equipment installation acquired through two NSF grants totaling $250,000;
2) development of learning strategies associated with the acquisition of new equipment;
3) the initiation of intra-district exchange of instructional methods and materials, notably in the area of CAI but including slide-tape interactive programs;
4) the growing capability to share the learning potential of the Center with others;
5) the use of the Center as a showcase for innovative curriculum and teaching methods; visitors from both foreign and from other states as well as from our own district have expressed an interest in the LSLC "idea", and the technology employed - visitors have been received from India, Taiwan, Australia, Rhode Island, Utah, Texas, The Northrup Aircraft Corporation, CSUN;
6) the use of the Center for meetings and workshops, including
   a) a workshop put on by the American Cancer society in conjunction with Microbiology teachers;
   b) a workshop put on by the California State Chancellor's office to train select persons from the LACCD, the University of California system and the California Colleges to access a data base being established at the University of California, Irvine;
   c) LACCD CAI meetings;
7) the Chancellor's award for the enhancement of instruction in the Life Sciences (1979).

APPENDIX I

CAI Programs Developed and in Use at
Los Angeles Valley College

SHORT ANSWER LESSONS

LIBRARY 2059

SHORT ANSWER LESSONS

Subject	Abbreviation
Metric System	measurement
Microscope	microscope
Taxonomy	anitax
Enzymes	enzymes
Cells	cells
Leaf	leaf
Cell Reproduction	cellrepro
Flower	flower
Development Sea Urchin	seaurchin
Development Chick	chick
Bones of the Upper & Lower Extremities	bones
Bones of the Skull	bones2
Reproduction & Enzymes (Endocrinology)	endoreview

APPENDIX II

CAI Programs Developed by Los Angeles Community College Biology Departments, Including Los Angeles Valley College

MULTIPLE CHOICE LESSONS

LIBRARY 2080

MULTIPLE CHOICE LESSONS

Subject	Abbreviation	
Blood	blood	
Blood	*bloodcells	
Breathing	breath	(physiology of respiration)
Cardiovascular System	cardio	
Heart-Cardiac Rate	cardioald1	
Heart-Cardiac Rate	cardiosld2	
Cell Division	celldiv	(cell reproduction)
Cells Basic Ideas	*cellquiz	
Spinal Cords & Its Tracts	*cordtracts	
Digestion	*digl	
Electrocardiograms	*ecgl	
Endocrinology	endo	
Enzymes Basic Ideas	*enzymesar	
Endocrinology	endoslide	
Genetics Drosophilia	*geneticsl	
Genetics F1 generation	*genetics2	
Genetics F2 generation	*genetics3	
Physiology of Heart	heart	
Hormones & Metabolism	horm	
Spectrophotometry	labquizl	
Electrophoresis	labquiz2	
Circulatory system	labquiz3	
Electrocardiogram	labquiz4	
Metabolism	metab	
Metabolism	metabsld1	
Metabolism	metabsld2	
Molecules	molecules	(physiology-chemistry)
Muscle physiology	*muscl	
Neuromuscular physiology	*neuromusc	
Nervous system	*neuronsl	
Nervous system	*neurons2	
Renal physiology	renal	
Endocrinology & Reproduction	reprod	
Human Reproduction	*repro2	

*Computer lessons developed at Los Angeles Vailey College; these may be accessed by other computers in the District.

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